

Space News **ROUNDUP!**

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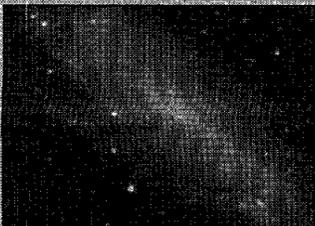
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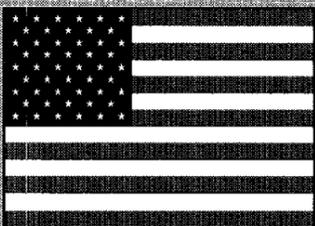
Cosmonauts beam down images of damage to Mir following Progress collision. **Page 2**



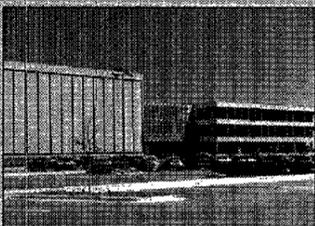
Two JSC workers help area students build a motorized walker for senior citizens. **Page 3**



JSC astronomy buffs join Texas gathering, earn reputation for gadgetry. **Page 4**



Here's the schedule for JSC's upcoming American Heritage Week observation. **Page 5**



Manned Spacecraft Center calls in employees from rented Houston offices. **Page 6**



Pictures tell the story of a successful Moody Gardens grand opening. **Page 8**

Mir stable after Progress collides

By John Lawrence

Stable conditions have been restored aboard the Russian Mir Space Station following a collision Wednesday, June 25, with a Progress resupply vehicle.

Mir 23 Commander Vasily Tsiblev, Flight Engineer Alexander Lazutkin, and U.S. Astronaut Mike Foale are unharmed and were reported to be in good spirits following the incident, although an extreme

power-down resulted from reduced power generation from a damaged solar array on the Spektr module. Foale described the situation via audio downlink through the Wallops ground station on June 28:

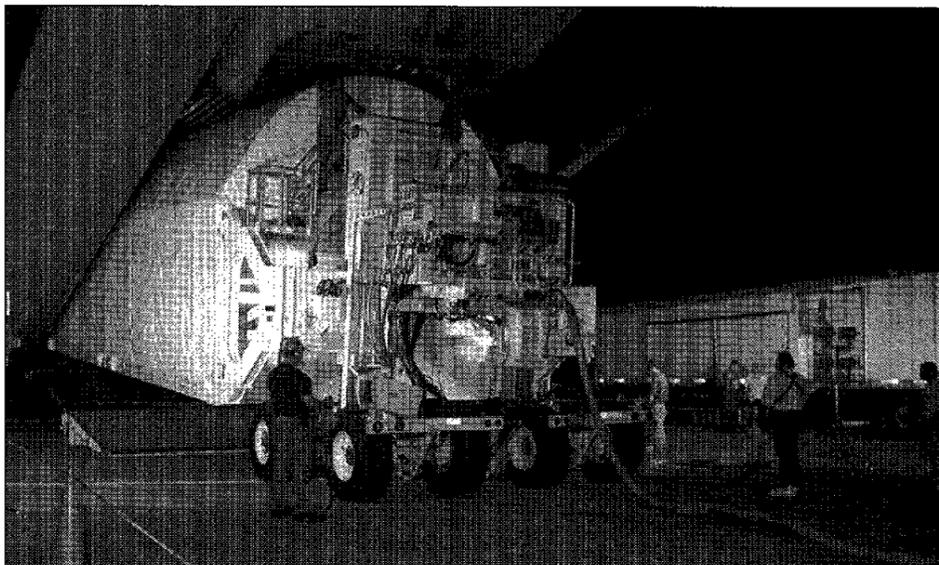
"The biggest picture in all of this is we did lose the Spektr module out of this event," he said. "There's a chance that power may be restored to that module in the next few months.

"Quite a lot of American life science equipment was left in that module along with my personal effects," Foale continued. "Since then I've managed to find myself a toothbrush and toothpaste and clean clothes and even a pair of shoes to run with so life is getting back to normal.... I'm looking forward to doing the major experiments that are now left for me to do in the Priroda module, in particular the creation of gels

in space and the continuation of the Greenhouse experiment, doing two more generations, trying to actually grow the seeds that we're producing right now and planting those in the next few weeks to see if we get plants out of those.

"Other than that," he concluded, "let's just hope that things will get back together again and normal as soon as possible on the station."

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NASA Photo KSC-97EC-0922

Node 1, the first element of the International Space Station to be manufactured in the United States and the first to be launched on the space shuttle, is unloaded in its container. Support personnel removed the node from an Air Force C-5 jet cargo transport at Kennedy Space Center's Shuttle Landing Facility on June 23 after its arrival from Marshall Space Flight Center. The 18-foot-in-diameter, 22-foot-long aluminum module was transported to the Space Station Processing Facility.

Columbia to finish science mission

By Ed Campion

Following an expedited processing session at Kennedy Space Center, *Columbia* and the STS-94 crew were to launch July 1 to complete the experiments and activities associated with Microgravity Science Laboratory-1, cut short in April because of suspect performance of a fuel cell.

The manager of NASA's microgravity research program said teams of researchers are ready to take the Microgravity Science Laboratory back into orbit with the same vehicle, crew and experiment activities originally planned during STS-83.

"Those four days allowed our science team to barely open the door to tantalizing scientific research," said Joel Kearns, manager of NASA's Microgravity Research Program

Office at Marshall Space Flight Center. "We were able to verify that we are headed in the right direction. But we were not able to reach our destination because of the shortened mission."

Kearns said the four-day test under flight conditions on STS-83 showed the experiment hardware performed "extraordinarily."

"All activated research apparatus functioned in an outstanding manner. This upcoming mission has the potential to add considerably to our basic scientific knowledge and our quality of life here on Earth," Kearns said.

Commander Jim Halsell, Pilot Susan Still, Payload Commander Janice Voss, Mission Specialists Mike Gernhardt and Don Thomas

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JSC employees to receive NASA's highest honors

NASA deputy administrator to join JSC director in presenting prestigious awards

NASA astronauts are among the employees who will receive the agency's highest honors in a ceremony to be held at 2 p.m. Tuesday, July 15, in Teague Auditorium.

This year's ceremony will honor individuals and groups nominated by center management and selected by the Incentive Awards Board at NASA Headquarters to receive NASA's highest honorary awards. Those selected to receive Senior Executive Service rank awards also will be recognized.

Each recipient of a NASA medal will be presented a framed certificate signed by NASA Administrator Daniel S. Goldin. Individuals selected to receive Group Achievement Awards on their team's behalf will

receive a framed certificate at the ceremony. Certificates for individual participants of teams will be forwarded to the nominating organizations at a later date. JSC Director George Abbey will make the presentations with the assistance of NASA Deputy Administrator Gen. John Dailey.

Recipients are encouraged to invite family members, friends, and coworkers to attend the ceremony with them. Following the ceremony, a reception will be held in the lobby of the auditorium for award recipients and their guests. Supervisors are encouraged to allow employees to attend as their workloads permit. For further information about the ceremony, contact Helen Harris at x38413.

First U.S.-built station module now in Florida

The International Space Station Program passed a major milestone June 23 as the first U.S.-manufactured component began a year of launch preparations at Kennedy Space Center.

A connecting module, called Node 1, was shipped by cargo aircraft to Florida from the Marshall Space Flight Center's Space Station Manufacturing Facility in Huntsville, Ala. The node will be the first U.S.-built segment for the station to reach orbit when it is launched in July 1998 aboard the Space Shuttle *Endeavour*.

"The International Space Station has begun moving from the factory floor to the launch pad," Program Manager Randy Brinkley said. "By the time Node 1 is launched next year, pieces of the station will be leaving factories in locations worldwide to be readied for launch, and the first piece already will be in orbit. From now through the turn of the century, the processing of station components will be a major focus at the Kennedy Space Center."

The crew of *Endeavour* will use the shuttle's robotic arm to dock Node 1 with the Functional Cargo Block as the node sits atop the orbiter docking system in the shuttle's cargo bay. The Functional Cargo Block is a component that supplies early power and propulsion systems for the station. It will be the first element to be placed in orbit and will be launched two weeks before the STS-88 mission on a Russian Proton rocket from the Baikonur Cosmodrome in Kazakhstan. After the two components are linked together, three space walks will be performed from the shuttle to connect power, data and utility lines and install exterior equipment.

"It's always a significant milestone when your hardware shows up at the Cape for processing, to be put aboard an orbiter for you to take it up into space," said STS-88 Commander Bob Cabana. "I've got to tell you, it's really something—we were over at the Space Station Processing Facility this morning taking a look at it. It's come a long way. Seeing the hardware at the Cape gives you faith that this is going to happen, that we're going to do this."

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WSTF Photo 0597-1437

WASHING WITH WATER—Paul Ziehl, an AlliedSignal mechanical technician in the White Sands Test Facility Component Test Facility, reassembles the Fleet Leader Orbital Maneuvering System engine. This engine was used to certify a water decontamination procedure to replace the previous freon and isopropyl alcohol procedure. Transferring the refurbishment task from the vendor to WSTF and implementing the cheaper procedure will save the shuttle program more than \$500,000 per engine.

Foale reports conditions 'getting back to normal'

(Continued from Page 1)

Tsibliev was testing the Progress' manual redocking system, guiding the capsule by using the teleoperated "TORU" system from the core module. The collision occurred shortly before the beginning of a communications pass with Russian ground controllers. When communication was established at 4:18 a.m. CDT (1:18 p.m. Moscow time), the crew informed controllers that the vehicle had struck the station and that the station was losing pressure.

Progress had come in very fast, Tsibliev reported, and he could not stop it. Progress struck a solar array and a nearby radiator on the Spektr module, causing Spektr to begin losing pressure.

The crew acted quickly to seal off Spektr, and at 5:53 a.m. CDT reported that the station's pressure had stabilized and Progress had separated to a safe distance from Mir. The station initially was spinning at approximately one degree per second due to the collision, but the spin had stopped and Mir

returned to a stable condition. To conserve power the crew shut down thermal control systems, ventilation systems, and experiments.

The Spektr module contains several NASA science experiments, stored items, and Foale's personal effects. Spektr experiments include a centrifuge, radiation monitoring experiment, and earth observation equipment. Food, water, and other supplies are stored in other modules. The accident also resulted in the loss of power from Spektr's four solar arrays, which furnish Mir with about half its electricity. Contingency operations for the next several days focused on optimizing power generation and charging batteries.

By Saturday morning, Foale, communicating through NASA's Wallops Island, Va., station, told Phase I managers that most systems and some experiments had been reactivated, and that "life has been getting

back to normal for me." A downlink video released through Russia early Sunday showed the crew apparently comfortable, rested, and in good humor, and the interior of Mir to be well lit. Monday, Mir had regained automatic attitude control through its gyrodyne system.

The Russian Space Agency moved quickly to establish teams to investigate the cause of the accident and to review contingency options to work toward the restoration of normal activity aboard Mir. At week's end, the Russian Mission Control Center was conducting additional tests with the Progress in an effort to understand the malfunction.

Yuri Koptev, the head of the Russian Space Agency, discussed plans to recover power from the three undamaged Spektr solar arrays. He announced a special "plate" is being manufactured that will be mounted between the node to which the Core module

and the Spektr are attached during an internal "space walk" by Tsibliev and Lazutkin in mid-July. Foale will be stationed in the lower stage of the Soyuz capsule during the procedure, and will be wearing his own space suit.

Koptev said that the plate, through which 22 cables can be passed, is in the final stages of manufacture. The cables will be used to bring power from the Spektr arrays to the Core module to maintain proper charging of a variety of Mir batteries, and to restore the capability to gimbal the arrays for maximum exposure to sunlight.

The suited cosmonauts' activities could also include an inspection of Spektr to locate the puncture or gash that resulted from the collision and perhaps efforts to retrieve some items from inside Spektr. This plan does not include action to patch or restore pressure to the Spektr module.

The repair items would be delivered to Mir on the next Progress ship, now scheduled for an early-July launch.



Jett manages NASA training in Star City

Astronaut Brent Jett will replace Michael Lopez-Alegria as the NASA manager of operational activities at Star City, Russia, near Moscow.

The eighth astronaut to serve in this rotational position, Jett will continue to support the training and



Jett

preparations of NASA astronauts at the Gagarin Cosmonaut Training Center, Star City. The Navy commander will be the primary liaison between NASA and GTC management, and

will continue the operational and personal relationships with Star City management and the cosmonauts as American astronauts continue to live and work in Russia.

Jett, who departed for Russia on June 22, joins fellow astronauts Wendy Lawrence, Dave Wolf, Bill Shepherd and Andy Thomas, currently training in Star City. Lopez-Alegria will return to JSC to begin training as an extravehicular activity crew member for STS-92, an assembly mission for the International Space Station.



NASA Photo

Video footage taken by Mir crewmembers June 25 and downlinked to Earth shortly after the collision depicts damage done by a collision with the Proton resupply vehicle during docking maneuver testing. The crew remains in good health.

Imax to document station assembly in 3-D

The film format some astronauts have called the closest thing to actually being in space will be used to document the assembly of the International Space Station.

Imax and NASA are cooperating on their sixth effort to convey the space experience through film. The new film will begin production next year and will document the assembly of the International Space Station in the 3-D Imax format. It is hoped that the three dimensional aspect of the production will help to convey this exciting new phase in the space program.

"Capturing the assembly of the International Space Station in this realistic and compelling format will help NASA share this experience with the public. After all, the station

belongs to the public and they have a right to watch it become a reality," said NASA Administrator Daniel S. Goldin.

Production plans include two cameras to cover the early phase of station construction. One camera will be placed in the shuttle cargo bay to capture the assembly space walks and exterior construction footage. The cargo bay camera is designed with a multi-focal turret lens which will allow for the greatest range of perspectives. An interior, hand-held camera will document the crew activities inside both the shuttle and the new station. A new camera is being developed for this purpose. In addition to accommodating the 3-D film, the new camera is expected to be lighter and battery operated,

allowing for increased mobility.

Imax plans to document the construction of the new space station beginning with early ground-based training activities. The first 3-D Imax cargo-bay camera is scheduled to fly aboard STS-88, the second American assembly flight. The interior camera will be on the station beginning on the fourth American assembly flight and is scheduled to return after the seventh American assembly flight.

The contract between the space agency and the film company gives Imax three-year feature film rights but grants NASA ownership of raw film stock. Imax will also fund the hardware integration performed by JSC which will allow the footage to be shot.

Pathfinder landing marks first Mars visit in decades

By Elizabeth Soutter

On July 4, the first U.S. exploration of the surface of Mars in 21 years will begin with the touchdown of the Pathfinder explorer on the surface of the red planet.

The Mars Pathfinder mission is the second launch in the Discovery Program, a NASA initiative for small planetary missions with a maximum three-year development cycle. It was built by the NASA's Jet Propulsion Laboratory and the California Institute of Technology.

Pathfinder is scheduled for a 12:07 p.m. CDT touchdown on July 4, ending a seven-month voyage through space. If conditions are normal, the vehicle will begin transmitting through a low-gain antenna, relaying telemetry from all engineering and subsystems and the first science data about the atmosphere taken during descent. A normal delay in communications means that the first signals from the surface of Mars will not be received until approximately 1:09 p.m. CDT.

A high-gain antenna transmission will be the next objective. Such a transmission would allow the vehicle to send the first pictures of the landing site to Earth. Initial images will be used to assess the condition of the craft and to gauge the status of the mission. The first color images will be of the immediate area surrounding the landing site. Partial panorama views will be transmitted in black and white.

The rover is scheduled for deployment around 8 p.m. JSC time that evening. The rover, named Sojourner, will provide the first black and white, 360-degree images of the Martian landing site. The Sojourner rover then will begin its mission, collecting data for transmission to Earth. The mission is expected to last seven Martian days, or Sols. A sol is equivalent to 24 hours, 45 minutes.

The rover is primarily a technology experiment itself, designed to test microrover performance in the poorly understood Martian terrain

so that future rovers may be designed to be effective in navigating and moving about the surface of Mars. The craft has three main objectives: technology experiments, science experiments and mission experiments.

Technology experiments will focus on the effectiveness of the Pathfinder/Sojourner design and include UHF link tests, a cataloging of sinkage in each Martian soil type, and vehicle performance data. Rover science experiments are aimed at gathering data on the planet itself, including an X-ray spectrometer and terrain imaging. Mission experiments are designed to assess the status of the vehicle and its capacity to perform as designed through lander imaging and damage assessments.

The microrover is powered by a solar panel that is backed-up by batteries. The craft is a six-wheeled vehicle of a rocker bogie design that allows the vehicle to move over large obstacles. Each wheel is independently actuated and geared, providing superior climbing capability in soft sand. The front and rear wheels are independently steerable, allowing for the vehicle to turn in place. The microrover's top speed is 0.4 meters per minute.

Commands for the microrover are generated and analysis of telemetry is performed at the microrover control station as part of the Pathfinder lander's ground control operation.

The name of the Sojourner rover was selected as part of an international contest of students under the age of 18. The students were asked to submit the name of a heroine and an essay describing why the microrover should be named for her.

The winning entrant was Valerie Ambrose, a 12-year-old student from Bridgeport, Conn. She submitted an essay advocating Sojourner Truth, an African-American woman who lived during the Civil War era and was an activist and champion of abolition and women's rights. The name Sojourner means traveler.

Strong El Niño developing; forecasters predict local impact

With hurricane season beginning, weather forecasters and local residents alike are turning their attention to unusually strong El Niño air mass conditions developing over the Pacific Ocean.

The El Niño is an abnormal state of the ocean-atmosphere system that develops every few years. It involves warming of surface waters, and can have important consequences for weather around the globe. It appears this El Niño will be the strongest to develop since the fall of 1982. El Niño effects are likely to be observed the coming November through March in the form of cooler and wetter weather for the southern half of the United States and unusually

warm weather in the northern half of the country.

The El Niño of 1982 was the greatest ocean-atmosphere disturbance ever recorded. Its effects were especially powerful in the Gulf Coast states. Heavy rains and flooding in this region were blamed for \$1.2 billion in losses to property and agriculture between December 1982 and May 1983. At least 50 deaths also resulted from flooding. Meteorologists at the Southern Region Headquarters of the National Weather Service compiled the following assessment of other effects in the South that were linked to that El Niño:

In every Southern state, from New Mexico

to Florida, flooding occurred at some time between November 1982 and October 1983, and much of it was attributed to weather systems triggered by the unusually strong El Niño. Numerous rainfall and flood records were set. Florida and Louisiana experienced record-breaking drenchings that persisted for months. Heavy rains in December boosted the 1982 total for parts of Louisiana to nearly 90 inches, more than 1 1/2 times the normal rainfall. During the year severe major flooding also struck Mississippi, Arkansas, Oklahoma, and Texas. New Mexico, a normally arid region, suffered rains in excess of 5 inches in October. Rains and melted snow from across the entire Mississippi River

Valley produced one of the major Mississippi River floods of this century.

An unprecedented number of low pressure systems formed in the Gulf of Mexico during that winter. These resulted in frequent gales over the Gulf and heavy rains over south Florida. Simultaneously, winter cold air outbreaks from the north were suppressed, so although the winter in the South was wet, it was generally mild.

The effect of El Niño on hurricanes and tropical storms is less well established, because the influences are inconsistent.

More information can be found at <http://www.pmel.noaa.gov/toga-tao/el-niño/home.html>.

Community News

JSC scientists reach out, help local students, seniors

By Elizabeth Soutter

With the help of two NASA engineers, four Friendswood Junior High School seventh-graders have built a motorized walker-on-wheels that is earning them high accolades and a pending U.S. Patent.

The four students—Tessa Herrera, Brian Ayers, Justin Zandt and Jenny Ayers, daughter of Johnny Conkin, a University Space Research Association's visiting scientist—got together to enter a contest Herrera had read about in "Discover" magazine last January.

The "Bayer-National Science Foundation Contest for Community Innovation" was calling for sixth, seventh and eighth graders in groups of four to design science projects that would better their communities. The contest was sponsored by Bayer, Space Center Houston, the National Science Foundation and Disney World. Herrera and the others asked their science teacher, Carol Lee, to be their sponsor.

The Friendswood four began their project by interviewing residents at the Friendswood Retirement Center. The seniors they interviewed expressed a common need: an easier method of traveling small distances along hallways.

The most common method of moving around the Senior Center is to use a walker. This is a lightweight metal frame that provides support as the user walks. A standard walker must be lifted with each step the user takes, making it cumbersome. Additionally, the lifting motion was painful for those seniors who had arthritis. A standard walker also requires the use of both arms, which makes it difficult to carry anything. An alternative to a walker would be a wheelchair. The seniors prefer to have the option of walking.

The Friendswood kids took all of this data into account and came up with the idea for a motorized walker on wheels. They named their device "WOW," an acronym for Walker on Wheels, and submitted the design and an essay detailing their research to the contest. Each of the 10 contest regions in the United States selected three teams as semifinalists. The Friendswood four were among those selected from the region that included Texas. At the semifinalist luncheon at Space Center Houston, the Friendswood team was announced as the regional finalist and awarded \$250 to fabricate a WOW prototype.

Armed with a design and an idea, the Friendswood kids needed help implementing their project. Cathy Kramer, manager of the JSC Biomedical Hardware Development and Implementation Office, had participated with members of her office in several Educational Outreach programs at Friendswood Junior High School. Seventh grade science teacher Carolyn Lee remembered Kramer from events like National Engineer's

Week and the Science Fair and suggested they contact her for help.

Kramer and her husband, Bob, a senior JSC engineer with Hamilton Standard, agreed to help the four young scientists implement their design. Using their garage as a workshop, the Kramers spent five weekends working with the seventh graders. "We agreed to help them with the design," Cathy Kramer said, "but they had to build it themselves."

The Kramers helped the kids modify the walker design so that it was feasible and incorporated all the elements the seniors had asked for. They started by constructing a platform of wooden planks and mounting it on wheels. The students made use of the power saws and drills the Kramers had in their home and many of the supplies came from the Kramers' garage. "My husband and I like to invent things, so we have a lot of gadgets," Kramer said.

After some experimentation the team found that cordless drills inserted into the right and left front wheels were a simple and effective way to power and navigate the unit. The drills were mounted on metal shafts that were high enough to be reached comfortably from a standing position. Squeezing the triggers of both drills propels the walker forward. To make a turn, the user can apply more power to the opposing side. This eliminates the cumbersome lifting action required of standard walkers but still provides comfortable, mobile support. A narrow platform on the unit provides the option of riding, and a bag on the front of the walker allows the user to transport small items easily.

The Friendswood kids finished WOW in time to dismantle it and load it onto a plane to Florida for the final judging. Once there, they set up a booth at Disney World's Epcot Center Innovations Exhibit. They staffed the booth for five days, answering questions about their design and talking to media and international visitors. When they were not acting as ambassadors for their project, they were being taken through the Disney World exhibits for a behind-the-scenes look at the engineering of attractions such as Haunted House and Space Mountain. This schedule was more demanding than the four had anticipated, and left little time to enjoy the park.

"They didn't think it would be so much work when they got there," Kramer said.

The 10 finalists' projects were judged on May 29. The majority of the other teams had worked on community recycling programs and other socially based projects.

"The parameters of the competition were not real clear," Kramer said. "Miss Lee thought for sure these kids had won. Everyone was coming by and video taping (the WOW), everybody was riding on it and manufacturing firms were passing out their cards."



JSC Photos 97-06958, 97-06959 by Steve Candler

With the help of NASA engineers, students from Friendswood Junior High School built a motorized walker-on-wheels. Above: From left are student Justin Zandt, Cathy Kramer, manager of the JSC Biomedical Hardware Development and Implementation Office, Seventh grade science teacher Carolyn Lee, and students Brian Ayers and Jenny Ayers. Left: Kramer and Lee with the new motorized walker-on-wheels.



Given that the majority of the projects were similar, contest officials decided to judge the projects on the basis of their socio-ecological value. Although they did not win, the Friendswood four did not go home empty-handed. Several companies expressed an interest in marketing the WOW, and the students have applied for a patent. In addition, contest officials classified the four and their project as automatic finalists for next year's contest. They also have entered two

additional science competitions this summer. "It's neat to see kids willing to give up their Saturdays and Sundays and work on something and see them thinking of senior citizens... they weren't focusing on themselves," Kramer said.

Kramer accompanied the crew to Florida with her 13 year-old son, Robert. She and her husband continue to watch the WOW project with interest to see where it will lead next.

Employees to expand knowledge in programs

Eleven JSC employees were selected for the 1998 Project IQ and JSC Fellowship Programs.

Employees who will participate in the Project IQ program are Yvonne Grimm and Esther McFarland of the Business Management Directorate, Jessica Cordero of Mission Operations, Frank Dacus and Ernest Romero of Engineering and Carmen Hollins and Betty Wallis of Space and Life Sciences.

Over the next two years, these employees will improve their skills and qualifications by attending college classes toward their undergraduate degree. In addition, they will be permitted up to eight hours duty time per week to attend classes. JSC will support these students by paying for their tuition, fees and text books.

Four JSC employees were selected to participate in the JSC Fellowship Program, which provides one year of full-time graduate study with salary.

Evelyn Orndoff of Engineering will attend North Carolina State

University working toward a doctorate in textile science and engineering; Charles Campbell of Engineering will go to the University of Minnesota working toward a doctorate in aerospace engineering and mechanics; Howard Wagner of Engineering will attend Rice University working towards a Ph.D. in Mechanical Engineering; and, Paul Marshall of the International Space Station Program Office will go to George Washington University working toward a master's of science in engineering management.

Criteria used for selections include the applicability of the chosen area of study and its effectiveness in contributing to the achievement of JSC's missions and goals, a brief statement of academic courses completed, the written recommendation of the division chief and the level of activity in the employee's office. JSC strongly supports this opportunity so employees may receive advanced academic training thus enhancing professional and personal growth.

JSC Safety Alert

Emergency Power-Off Button

What Happened

Recently, a person preparing to leave a room in Bldg. 30 South pushed an Emergency Power Off Button—a button used for emergency shutdown of critical computer equipment. Because the power was removed in an uncontrolled manner, the computer equipment was damaged. Had this incident occurred during a mission, critical data and monitoring capability could have been temporarily lost.

Outcome of Investigation

The Emergency Power Off Button is red with a red sign above it stating its intended use. Numerous rooms in Bldg. 30 South, and elsewhere across the center, are controlled areas. These areas require a button to be pushed to release the mechanism on the exit doors. Exit buttons and the signs above these exit buttons are usually both red. The individual mistook the red Emergency Power Off Button and sign for a red exit button and sign.

What You Can Do

First and most obvious, always know what a button or switch is supposed to do before you push it. Never push a button, or turn a switch, with the intent of finding out what it does. Second, look around your work area to verify that all switches and buttons are clearly and distinctly labeled. Also, make sure that all of the area occupants (including guests) understand what each switch or button is supposed to do. Pay particular attention to those buttons or switches that may play a role in critical/emergency situations. Last, consider human factors when designing, positioning and labeling switches and buttons. Further safeguards have been placed on the Emergency Power Off switches, including the addition of a pull ring on the cover. It is hoped this additional pull ring will cause a potential user to be certain of his/her actions before they push the button. Additionally, the color of the sign above the switch has been changed to distinguish it further from exit signs.

Amateur Astronomers

JSC workers who can't get enough space on the job turn to telescopes on vacation

By Karen Schmidt

While some JSC employees use their time off to forget about space, members of JSC's Astronomical Society prepare for months to spend their vacation observing distant galaxies.

About 25 members of JSC's Astronomical Society recently spent a week at the annual Texas Star Party, a gathering of amateur astronomers from as far away as Australia, at the Alto Frio Baptist Encampment near San Antonio. Sponsored by the Astronomical League, this year's party attracted more than 600 astronomers.

"The Texas Star Party is a combination summer camp, family reunion, technical conference and scientific expedition," said Dennis Webb, former president of JSC's Astronomical Society and manager of International Space Station integration. "I've made friends from all over the country over the last six years, and it is the highlight of my observing year."

Webb and other members agreed the challenge of attending is not only data collection but getting sensitive equipment prepared and shipped across Texas.

"Everyone is working on their latest projects right up till the last minute, and quite often don't finish them till they are at the star party," said

member Chuck Shaw, a shuttle flight director. "This is kind of like bringing something to the launch pad without prior testing. The result is a lot of tinkering not in the controlled confines of a garage or shop, but out on the observing field, where dropping tiny critical parts into the grass can cause fits of despair and frustration. To avoid this, the 'prepared' amateur telescope maker has to bring spare parts for everything, which takes up room in the truck normally reserved for things like sleeping bags and clean clothes."

The JSC group set up together and the area quickly became known as "Gizmo City." Webb said many observers requested Astronomical League observing plans to earn certificates while others accepted assignments to search for supernova in various galaxies. Club visual observer Bob Hammond, a McDonnell Douglas safety engineer, was the most productive supernova campaigner, screening 12 galaxies during his one night of survey.

Most JSC observers agreed that a highlight of the week was their hands-on experience with a charge coupled device imaging camera, which provided a rewarding challenge in the form of mastering processing techniques.

"The microprocessor and charge coupled device electronic imaging chip really came of age in the telescope-making and amateur astronomy world at this year's Texas Star Party," said member Al Kelly, JSC's contracting officer's technical representative for the mission systems contract.

"Time with Richard Berry, one of the creators of the charge coupled device camera and related software, was superb," Shaw said. "I learned

more about image processing during the three days I spent with Richard and with our group than I had in the last year of working only occasionally in this rather subtle and complex area of expertise."

Shaw's time with Berry was well spent, earning him triple honors during the awards presentation on the final night of the party. Shaw's photo of M66 won for best charge coupled device astro photo. Shaw received a certificate of merit for his telescope design, won a special award for his combination shopping cart and field-computer desk and was designated the "Bag Lady of Gizmo Alley."

While cloudy skies hid the stars for several days, the observers kept busy processing images from the first two nights. The club set up a processing lab in the men's bunkhouse and tried various processing algorithms to obtain the best possible photos out of the digitally captured images.

"This was the only astronomy happening, so a crowd watched even in the wee hours," Webb said. "Amateur radio operators transmitted these images to a simultaneous sister star party in New South Wales, Australia, bouncing the extragalactic images off the earth's ionosphere."

The observers spent their afternoons in talk, and JSC members contributed significantly to the presentations. Webb presented

a paper on the club's supernova campaign and moderated an afternoon of talks. Richard Nugent presented a paper on "Determining the Age of the Crab Nebula Supernova," while Al Kelly introduced headline speaker Richard Berry.

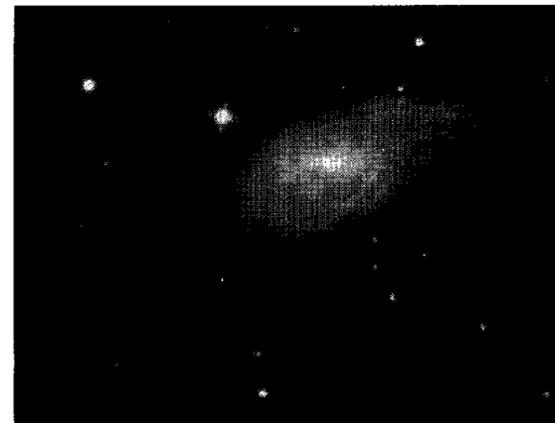
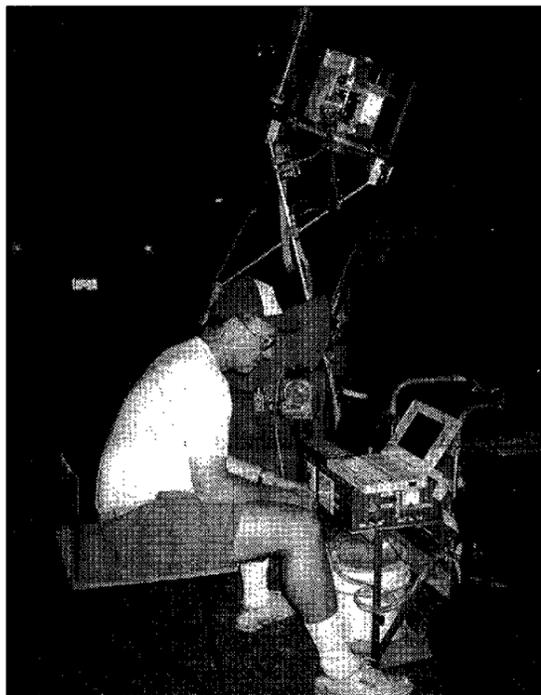
"My personal highlighted experience would have to be the two evenings spent observing with Stephen J. O'Meara," said Becky Schultz, the club president one of the editors of "Sky and Telescope" magazine and long time observer and writer of astronomy. "We spent some time trying to see M81 with the naked eye, as it was my proposed challenge object for the Texas Star Party. Stephen and I also shared our sketches and drawings of various objects we each had made in our log books."

The JSC Astronomical Society is open to anyone interested in learning more about astronomy. Beginning astronomers are especially welcome. The Society meets at the Center for Advanced Space Studies, 3600 Bay Area Boulevard, usually the second Friday of each month. Novice classes start at 7 p.m. and the main meeting starts at 7:30 p.m. For more information call Randy Moore at x41079. The JSC Astronomical Society is recognized by the Employee Activities Association and welcomes families and members of the surrounding communities. The club's website is <http://www.ghgcorp.com/cbr/jscas.html>

The club and Challenger 7 Memorial Park also host several public viewings. Employees may join the amateur astronomers from dusk until 10 p.m. Saturday, July 12 to view the stars of summer. For more information on this special event, contact Bill Williams x32272. □



Some of the JSC's Astronomical Society attendees at the Texas Star Party gather around Dennis Webb's 17.5-inch telescope. From left are Robert Taylor, Karen Taylor, Stefanie Taylor, Chuck Shaw, Becky Schultz, Dennis Webb, Ann Webb, Curtis Schultz, Richard Nugent, Robert Bradbury, Hernan Contreras, Chris Randall, Susan DeChellis, Marc DeChellis and David Contreras.



Left: Chuck Shaw at his console with the telescope. Above: Shaw's Charge Coupled Device astro photo of galaxy M66 earned him best image during the star party. After months of tinkering, the chattering computer-controlled stepper motors were accurately pointing his large 14-inch telescope long enough to take a deep CCD exposure picture of M66, a big galaxy in the constellation Leo

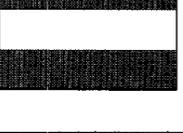
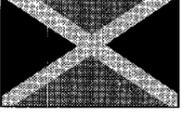
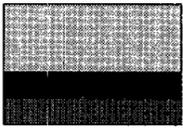
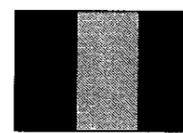
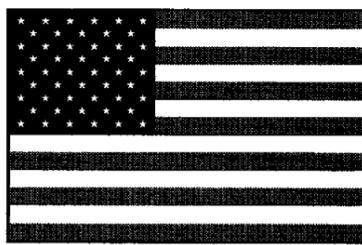
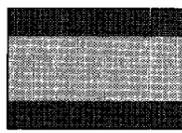
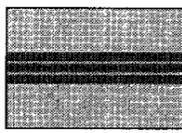
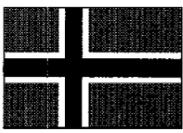


From left, JSC's Al Kelly, Chuck Shaw and Dennis Webb processing images on the porch. During cloudy nights the inhabitants of "Gizmo City" kept busy processing images from the first two nights. The club set up a processing lab in the men's bunkhouse tried various processing algorithms to obtain the best possible photos out of the digitally captured images. Amateur radio operators transmitted these images to a simultaneous sister star party in New South Wales, Australia, bouncing the extragalactic images off the earth's ionosphere.

Photos by Chuck Shaw, Logan Kelly and Dennis Webb



Al Kelly and his son Logan prepare for a night of star gazing during the Texas Star Party near San Antonio. Center: Kelly's image of galaxy NGC 4236 captured during a clear night at the week-long party. Kelly received national recognition as the first JSC Astronomical Society member to build his own charge coupled device camera.



JSC Photo 97-06956 by Steve Candler
 The Jhankar School of Dancing performed for the Bldg. 3 lunch crowd during JSC's Asian-Pacific American Heritage Month observance. The performance included classical and modern dances from India.

American Heritage Week

JSC celebrates cultural diversity around center

The fourth annual American Heritage Week celebration is set to begin Monday, July 7 and the Equal Opportunity Program Office and the American Heritage Committee are preparing a week-long celebration.

During the week activities will center around the Bldg. 3 cafeteria. Entertainers will provide a variety of music and employees will display their talents and hobbies beyond their work-related skills. The cafeteria also will offer a variety of ethnic specials throughout the week.

"American Heritage Week celebrates the diverse heritage of the entire 'Team NASA,'" said Equal Opportunity Program Director Estella Hernandez-Gillette. "Employees, families and friends of JSC and our aerospace partners are invited to come together to celebrate the similarities that bring us together as well as the differences that allow us to learn and grow together."

What started as a one-day celebration in 1994, is now a week-long celebration with a grand finale set for Monday, July 14. Food vendors for the grand finale include Logan Farms

Honey Glazed Hams, Tortuga Cantina, Double Dave Pizzaworks, Sweet Mesquite and Raja Quality Sweets and Restaurant. Entertainment during the grand finale will range from Native American dancers to Highlander Bagpipers. Check the schedule below for a complete list of entertainers.

Volunteers are still needed for a variety of tasks. Employees can call the Equal Opportunity Program Office at x30600 or June Bennett Larsen at x36080. Employees may volunteer as many hours as they wish—or as few as they can spare. □

Week-long activities

From 11:30 a.m.-1:30 p.m. in Bldg. 3

Monday, July 7

- Entertainment: Ambassadors International Ballet Folklorico.
- Cafeteria special: 2 chicken enchiladas, Spanish rice, pinto beans, guacamole salad, sour cream, roll, butter and drink.
- Exhibit: Art Day including painting, sculpting, modeling.

Tuesday, July 8

- Entertainment: JSC Patriotic Choir and Galveston County Soloists Sally Dickens, Sam Antley and Sheneka Ford.
- Cafeteria special: chicken fried steak, two vegetables, tossed salad, roll, butter and drink.
- Exhibit: Needlework including quilting, embroidering and wearable art.

Wednesday, July 9

- Entertainment: Chinese Senior Association Dancers and Singers.
- Cafeteria special: sweet and sour chicken over rice, one vegetable, roll, butter and drink.
- Exhibit: Collectibles including antiques and other items of interest.

Thursday, July 10

- Entertainment: Czech Dancers.
- Cafeteria special: smoked sausage, sauerkraut, German potato salad, roll, butter, and drink.
- Exhibit: Hobbies including craft and woodworking.

Friday, July 11

- Entertainment: Star Spangled Brass Band.
- Cafeteria special: spaghetti and meatballs, garden salad, roll, butter and drink.
- Exhibit: Anything Goes — an exhibit full of surprises.

Grand Finale

3:30-8 p.m. Gilruth Center Ballroom, Old Gym

Entertainment

- Opening Ceremonies
- Native American Invocation - Manshadow Waylett;
- Presentation of Colors - USMC (Tentative);
- National Anthem - George Gray;
- Welcome - JSC Director George Abbey;
- Mistress of Ceremonies - June Bennett Larsen
- Aldine Y.O.U.T.H. Singers
- Alabama-Coushatta Tribe Hoop Dancer
- New Faith Praise Dancers
- Jhankar School of Dancing
- Barbershop Quartet
- Classical Guitarist - Mr. Juan Manuel
- Traslavina
- Highlander Bagpipers

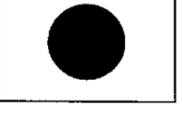
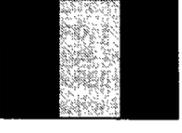
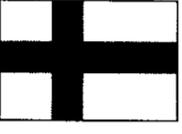
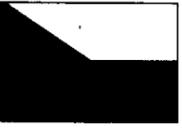
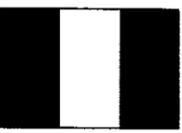
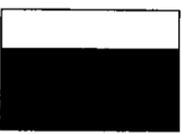
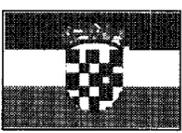
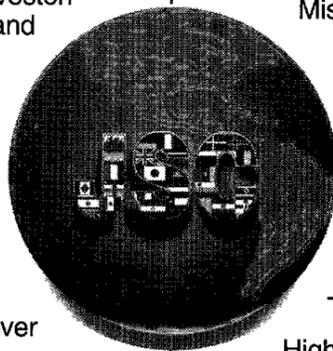
- Young Performing Stars of Texas Dancers and Singers
- Faith Gospel Singers
- Indian Dancers - Priyanka Patel
- Silent Ones Singers
- Astronaut Autographs (available throughout program)

Menu

- Ethnic foods, hot dogs, popcorn and refreshments.

Exhibits

- Selected items from the previous week's exhibits.



33 Years Ago at MSC

Final move to Clear Lake in works today

Reprinted from the June 24, 1964 Roundup

The final move from all leased facilities in Houston by the Manned Spacecraft Center employees and contractors will get underway today and continue through June 30 as more than 700 people vacate sites which were the last vestiges of the scattered center while the Clear Lake location was under construction.

Center employees at Ellington Air Force Base will continue to be located there until plans are completed to relocate them at the Clear Lake site.

Moving to the center will be 475 employees in the Flight Operations Directorate, 55 from the Systems Division, 201 contractor employees and six Department of Defense liaison and other NASA center representatives.

Most of these 737 people will be

located in Bldg. 30, which is the Manned Spaceflight Control Center, Houston. Their offices will be in the support wing and the lobby wing that leads into the operations wing.

Scheduled to move beginning today are 55 people in the Information Systems Division from Office City. They will be followed on Thursday by 185 persons in the Flight Control Divisions, who vacate the Stahl and Meyers building. They will be relocated in Bldg. 30.

Beginning on Friday and continuing over the weekend, 25 people from the Manned Spaceflight Control Center, Houston Program Office, 65 people from the Landing and Recovery Division and 200 from the Mission Planning and Analysis Division will vacate offices in the Houston Petroleum Center and move into Bldg. 30 at the center.

On June 30 the final move will be completed when 201 contractor



JSC Photo 64-14003

More than 700 employees will move this week to the Manned Spacecraft Center's new facilities in Clear Lake. Employees in the Manned Space Flight Control Center, Houston Program Office; Landing and Recovery Division; and Mission Planning and Analysis Division will occupy Bldg. 30.

employees will move from the IBM building over to the Clear Lake site. Of these 125 are IBM, 56 Philco and 20 represent other contractors. This group will also be relocated in Bldg. 30.

Included in the moves of the divisions above are six Department of

Defense liaison and representatives of other NASA centers as well as six persons from the procurement and contracts division. The latter six will move to the third floor of Bldg. 2.

When this group has completed their move to the center and Bldg.

30, the design occupancy for that building will have been reached at that time with all available space being occupied.

Leases for all temporary facilities in Houston will expire at the end of June and MSC employees will have been relocated prior to July 1.

Gilruth Center News

New Hours: The Gilruth Center will now remain open until 2 p.m. Saturday and close at 9 p.m. Friday.

Sign up policy: All classes and athletic activities are first come, first served. Sign up in person at the Gilruth Center and show a yellow EAA badge. Classes tend to fill up two weeks in advance. Payment must be made in full, in exact change or by check, at the time of registration. No registration will be taken by telephone. For more information, call x30304. Payment by cash or check.

EAA badges: Required for use of the Gilruth Center. Employees, spouses eligible dependents, NASA retirees and spouses may apply for photo identification badges from 7:30 a.m.-9 p.m. Monday-Friday; and 9 a.m.-2 p.m. Saturdays. Cost is \$10. Dependents must be between 16 and 23 years old.

Basketball: Registration is ongoing for men's summer basketball leagues for play on Tuesday, Wednesday and Thursday evenings. Cost is \$315 per team.

NASA Fitness Challenge: Runs through Aug. 31. Call x30301 for more information.

Complete Weight Control Program: Starts Sept. 16 with sessions on Monday, Wednesday and Friday. For more information call x30301 or x30302.

Hatha Yoga: A stress relieving, stretching and breathing exercise routine to unite body, mind and spirit. Classes meet from 5:30-6:30 p.m. Thursdays. Cost is \$40 for eight weeks.

Nutrition intervention program: A six-week program to learn more about the role diet and nutrition play in health, including lectures, private consultations with a dietitian and blood analysis. Program is open to all employees, contractors and spouses. For more information call Tammie Shaw at x32980.

Defensive driving: One-day course is offered once a month. Next class is July 19. Pre-registration required. Cost is \$25.

Stamp club: Meets at 7 p.m. every second and fourth Monday in Rm. 216.

Weight safety: Required courses for employees wishing to use the weight room will be offered from 8-9:30 p.m. July 17 and 31. Pre-registration is required. Cost is \$5. Annual weight room use fee is \$90. Additional family members are \$50.

Exercise: Low-impact class meets from 5:15-6:15 p.m. Mondays and Wednesdays. Cost is \$24 for eight weeks.

Aikido: Introductory martial arts class meets from 5:15-6:15 p.m. Tuesday and Wednesday. Cost is \$35 per month. New classes begin the first of each month.

Aerobics: Classes meet from 5:15-6:15 p.m. Monday, Tuesdays and Thursdays. Cost is \$32 for eight weeks. Kristen Maidlow, instructor.

Ballroom dancing: Beginner classes meet from 7-8:15 p.m. Thursdays. Intermediate and advanced classes meet from 8:15-9:30 p.m. Cost is \$60 per couple.

Country and western dancing: Beginner class meets 7-8:30 p.m. Monday. Advanced class (must know basic steps to all dances) meets 8:30-10 p.m. Monday. Cost is \$20 per couple.

Fitness program: Health Related Fitness Program includes a medical screening examination and a 12-week individually prescribed exercise program. For more information call Larry Wier at x30301.

Gilruth Home Page: Check out all activities at the Gilruth online at: <http://www4.jsc.nasa.gov/ah/exceaa/Gilruth/Gilruth.htm>

JSC employees receive government patents

Ten center employees will be honored at 11:30 a.m. Monday, July 30 at the annual JSC Inventors Luncheon to be held at the Gilruth Center.

JSC Director George Abbey, along with JSC's Patent Counsel Ed Fein, will present awards to employees whose NASA patents were issued in 1996.

Honorees include: Engineering's Gregory Aber, James Akkerman and Richard Bozeman for the Rotary Blood Pump; Bozeman for the Control System for Prosthetic Devices, the System for Memorizing Maximum Values, the Acceleration Recorder and Playback Module and the Accelerometer Method and Apparatus for Integral Display and Control Functions; Joseph Cook of Engineering for the Displaceable Spur Gear Torque Controlled Driver

and Method and the Flexured Shaft Poppet; Michael Eubanks, Anthony Dao and Horacio de la Fuente of Engineering for the Bending and Torsion Load Alleviator with Automatic Reset; Naveed Quraishi of the International Space Station Program Office for the Autonomous Navigation Apparatus with Neural Network for a Mobile Vehicle; Space and Life Sciences' Glenn Spaulding and Flight Crew Operations' David Wolf for the Method for Producing Non-Neoplastic, Three Dimensional, Mammalian Tissue and Cell Aggregates Under Microgravity Culture Conditions and the Products Produced Therefrom; and Spaulding for the Constructing a High Density Cell Culture System.

Reservations are due July 24. Lunch costs \$9.35. For more information call Mara Pena at x30837.

Lunar rendezvous run set for July at Gilruth Center

More than 300 runners participated in the Information Systems Contract Fun Run recently and runners again may test their endurance during the Lunar Rendezvous Run.

In overcast weather, 352 runners and numerous volunteers raised \$7,800 for the Bay Area Habitat for Humanity during the third annual ISC Fun Run. Moiz Husain took home men's first place honors in the 5K race and Gigi Rohmfeld was the women's first place winner. Jake Dewey and Lydia Meza took home first place in the children's 1K run.

Runners again may test their endurance during the 19th annual Lunar Rendezvous Run to be held Saturday, July 12.

Lockheed Martin will sponsor the

5K event that will begin at the Gilruth Center. Participants will receive a T-shirt and refreshments and be eligible for door prizes. Entry fee is \$18 and interested employees may sign up at the Holiday Inn and pick up an information packet.

Employees planning to work on race day may want to take note that access to some buildings will be restricted during the event. Second Street from the Gilruth Center to Avenue B will be closed from about 7:15-9 a.m. Portions of Avenue B also will be closed for the race. Access to parking lots on these streets may be restricted.

For more information on the Lunar Rendezvous Run, call Dennis Halpin at x36093.

Ticket Window

The following discount tickets are available for purchase in the Bldg. 11 Exchange Store from 10 a.m.-2 p.m. Monday-Thursday and 9 a.m.-3 p.m. Friday. For more information, call x35350 or x30990.

Loving Feelings Concert: 8 p.m. Sept. 9 at the Summit. Tickets are \$38.

EAA Texaribbean Cruise: Nov. 22-30. \$200 deposit per person, final payment by Sept. 15.

Astroworld: \$22.75. Season pass \$56.75. Multi-visit \$37.50

Waterworld: \$11.50.

Moody Gardens: Tickets are \$9.50 for 2 of 4 events.

Space Center Houston: Adult \$8.95; children (4-11) \$6.40.

Seaworld: Adult \$27.25; children (3-11) \$18.25.

Schlitterbahn: Adult \$20.25; children \$17.50.

Splashtown: Adult \$14.50; children (3-9) \$11.50.

Movie discounts: General Cinema, \$5.25; AMC Theater, \$4.50; Sony Loew's Theater, \$4.75.

JSC logo shirts: Polo style, \$23. T-shirt, \$10.

Stamps: Book of 20, \$6.40.

Orbit: The book "Orbit" by Jay Apt, Mike Helfert and Justin Wilkinson is on sale for \$28.

NASA seeking anniversary slogan

With the 40th anniversary of the creation of NASA only 15 months away, Headquarters is seeking suggestions for a slogan to commemorate the Oct. 1 anniversary.

NASA began with the dissolution of the 43 year-old National Advisory Committee for Aeronautics. The new agency was formed with the intent of incorporating the aeronautical program with a new space program.

NASA inherited 8,000 people, three research centers and a \$100 million budget. NASA also acquired

the bulk of the American space arsenal—the Vanguard satellite project, lunar probes and rocket engine programs. Robert Gilruth was named to head the Space Task Group, formed to implement Project Mercury.

Slogan suggestions may be submitted in writing to Steve Garber in the NASA Office of Policy and Plans, Code ZH, or by e-mail at steve.garber@hq.nasa.gov. The deadline for entries is July 31. The winner will receive a special book about space exploration.



Christopher C. Kraft Jr.

Former JSC director earns generosity award

Former JSC Director Christopher Kraft is being honored by the American Diabetes Association with the Generosity to Mankind Award for 1997.

The award is bestowed annually by the association to individuals who "demonstrate leadership and commitment to improving the lives of others through personal and professional service." Kraft was unanimously selected as this year's award recipient by the association's board of directors and gala alumni.

Kraft is being recognized for 38 years of service to the space pro-

gram, beginning in 1945. Kraft was one of the original architects of flight control techniques still in use today and a pivotal figure in the Gemini, Apollo and early shuttle programs. He served as JSC Director of from 1972 to 1982. Kraft also is being recognized for his contribution to health care as a founding director of Park Plaza Hospital.

Kraft will be honored Dec. 31 at the Association's Midnight on the Moon gala at the Westin Galleria, Woodway Hall. The gala will serve as a fund raiser for diabetes research.

MCC open for viewing during STS-94

The Mission Control Center viewing room will be open to JSC and contractor badged employees and their families during portions of the STS-94 mission.

Based on a July 1 launch, employees will be allowed to visit the MCC from 11 a.m. -1 p.m. July 4. The MCC also will be open from noon- 2 p.m. July 5 and 6; 5-7 p.m.

July 7; 11 a.m.- 1 p.m. July 8; 11 a.m.-1 p.m. July 9; 1-3 p.m. July 10; 6:30- 9 p.m. July 11; 2:30-4:30 p.m. July 12; 1-3 p.m. July 13; 11 a.m.-1 p.m. July 14; 4-6 p.m. July 15; 3-5 p.m. July 16; and 5-7 a.m. July 17.

Employees must wear their badges and escort family members through the regular public entrance on the northeast side of Bldg. 30.

Children under 5 will not be permitted. No flash photography or loud talking will be permitted at any time.

Because of the dynamic nature of shuttle missions, viewing hours may be changed or canceled without notice.

For the latest information on the schedule, call the Employee Information Service at x36765.

Nominations for quality achievement due

Nominations are being accepted for the Quality Assurance Special Achievement and Recognition, or QASAR, program.

This award recognizes NASA and contractor personnel throughout the agency who have demonstrated or exhibited exemplary performance in contributing to quality products and services.

Nominees must have:

- Identified or implemented significant quality improvements to NASA products or services;
- Instituted continuous quality improvement through NASA and/or contractor action teams;
- Identified potential problems along with recommended corrective action to preclude major systems impacts; or
- Advanced the quality profession through other significant

accomplishments.

Additional criteria for awarding the prize would be a demonstrated superior level of work quality and conscientiousness, such as:

- Identifying an operational hazard that if not corrected could cause injury to personnel and/or damage to equipment or flight hardware;
- Identifying a problem that was undetected or exert extraordinary effort that resulted in necessary corrective action;
- Making recommendations that significantly improved a product, a service, quality methods, or procedures and/or resulted in significant savings; or
- Showing outstanding performance in fostering NASA/contractor "teamwork" and partnership.

Outstanding performance in leadership displayed in contributing

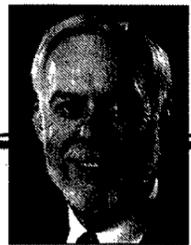
actively to the goals of NASA and its programs also is a possible criteria.

Typed, one-page nominations must be received by 5 p.m. July 25 to be eligible for this award cycle. Nominations should be mailed to NA/Lois Walker, and must include the following information: the nominee's full name, his or her name as it should appear on certificate. The nominee's complete organization or company name and a short paragraph describing the nominee's qualifications for the award. The nominator should include his or her own name, title, and telephone number. Nominations must be signed by the nominator and an approving manager.

Recipients will be presented a certificate, lapel pin and coffee mug with the QASAR logo.

Manager's Message

By Wayne Draper
Chief Financial Officer



Draper

NASA recently completed a detailed review of its financial management area in support of ongoing agency streamlining initiatives, and some changes in the way JSC will process payroll are expected to go into effect this month.

The analysis evolved from a 1993 National Performance Review, a 1994 NASA Streamlining Plan, the 1995 Financial Management Crosscutting Review and anticipated reductions in the NASA budget. The review indicated that NASA can achieve significant staff reductions by changing practices, processes and requirements. These changes require certain investments in support systems and staff development to ensure effective implementation.

The crosscutting review looked at benchmark information from other federal agencies and departments—responses came from Interior, Commerce, Transportation, Justice, Veterans Affairs, Environmental Protection Agency and Federal Emergency Management Agency.

One of the most interesting findings involved payroll processing. NASA was the only agency that did not process its payroll in a central location. EPA's ratio of payroll workers to employees paid was 1,600 to 1; NASA's ratio was 555 to 1. When contractors were included, the ratio became 462 to each payroll clerk.

With that information in hand, NASA decided to consolidate payroll processing.

First, NASA selected the center for consolidation—Marshall Space Flight Center. Marshall also is the consolidation center for the NASA Automated Data Processing Consolidation Center, so it was a logical choice to place the computerized processing of

payroll at this center. All NASA payroll will be processed in one computer run.

The Birmingham, Ala., Financial Center will make the electronic fund transfers of employees' biweekly pay. Marshall will process the year-end W-2's. For now, all other JSC processing remains at our own payroll office here at JSC.

We still: collect, validate, and keypunch timecards; run and deliver biweekly leave and earnings statements from the Marshall file; answer employees' questions and investigate concerns; prepare adjustments to time cards, as necessary; and provide all the same Human Resources services.

NASA plans to develop a leave and earnings statement that is uniform across all centers. When this happens, Marshall is expected to start running the standardized biweekly leave and earning statements for all centers. While this won't happen until fiscal year 1998 at the earliest, we can give you a heads-up on some of the planned changes.

Under the current plan, the form will: look very different, but contain the same information; be delivered on site, rather than mailed to an employee's home; and arrive by pay day consistent with legal requirements; JSC employees are accustomed to receiving their statements earlier.

The JSC Payroll Office in Bldg. T585 will continue to be your interface on payroll questions, concerns and time card adjustments. For more information contact Gwen Obert, Payroll Group Lead, at gwendolyn.s.obert1@jsc.nasa.gov.

People on the Move

Human Resources reports the following personnel changes as of June 20:

Additions

Theresa Vu joins the Engineering Directorate as a propulsion and power engineer.

Reassignments

Herbert Babineaux moves from the Safety and Reliability Assurance office to the Office of the Chief Information Officer as a data systems engineer.

Douglas Lee moves from International Space Station Program Office to the engineering directorate as a liquid propulsion systems engineer.

Ginger Milligan moves from the Office of the Chief Information Officer to the Center Operations Directorate as an office automation secretary.

Michael Van Chau moves from Flight Crew Support Division to a Mission Operations integration engineer.

Promotions

Susan Garman was promoted to associate director, management.

Robert Navias was promoted to deputy director of public affairs in the Public Affairs Office.

Arthur Beal was promoted to supervisory assistant in Flight Crew Operations.

Ven Feng was promoted to assistant, Flight Systems Operation, in the International Space Station Program Office.

Charles Harris was promoted to supervisory assistant, Aerospace Flight Systems, in the Space and Life Sciences Division.

Todd Schlegel and Terrance Taddeo were promoted to medical officers, Space and Life Sciences Division.

Michael Mannering was promoted to assistant, technical management in the Space Operations Management Office.

Janice Read was promoted to program support technician, Phase I Program Office.

Resignations

S.M. Nebrig, Business Management Directorate. John Burke, Engineering Directorate. Djuna Perine, International Space Station Program Office.

Retirements

Paul Romere, Engineering Directorate, 35 years

Dates & Data

July 8

Aero club meets: The Bay Area Aero Club will meet at 7 p.m. July 8 at the Houston Gulf Airport clubhouse at 2750 FM 1266 in League City. For more information call Larry Hendrickson at x32050.

July 9

PSI meets: The Clear Lake/NASA Area Chapter of Professional Secretaries International will meet at 5:30 p.m. July 9 at the Holiday Inn, NASA Road 1. Toastmaster Jessie Johnson will discuss "Stand Up, Speak Up," the dynamics of speech development and delivery. Dinner costs \$15 and reservations are due by Thursday, July 7. CPS re-certification points may be earned through this event. For more information call Elaine Kemp at x30556.

MAES meets: The Society of Mexican American Engineers and Scientists will meet at 11:30 a.m. July 9 in Bldg. 13, Rm. 156. For more information call G.D. Valle at x38835.

July 10

Airplane club meets: The Radio Control Airplane Club will meet at 7:30 p.m. July 10 at Clear Lake Park Community Bldg. For more information call Bill Langdoc at x35970.

SSQ meets: The Houston Clear Lake Chapter of the Society for Software Quality will meet at 6 p.m. July 10 at Ramada King's Inn, 1301 NASA Road 1. Cost is \$10 for members, \$12 for non-members. Earl Lee, of Lockheed Martin, will discuss "Protecting Effective Software Inspections from Bad Ideas." For reservations or details, contact Renne Peterson at (281) 335-2034.

July 11

Astronomers meet: The JSC Astronomical Society will meet at 7:30 p.m. July 11 at the Lunar and Planetary Institute, 3600 Bay Area Blvd. For more information call Chuck Shaw at x35416.

July 12

Lunar Rendezvous Run: Lockheed Martin will sponsor the 19th annual Lunar Rendezvous Run July 12 at the Gilruth Center. The run will consist of a 5K race and a 5K walk. Entry fee is \$13 if application is post-marked by July 5; \$18 after that. Applications are available at the Gilruth Center. For details call Willie Vanderbrink (281) 470-6715.

Star party: The JSC Astronomical Society and Challenger 7 Memorial Park invite the public to view the stars of summer from dusk until 10 p.m. July 12. Telescope viewing and more, free. For more information contact Bill Williams x2272.

Intermediate sailing lessons: The NASA Sailing Club, the Clear Lake Sailing Club and the Lido Fleet is offering an intermediate sailing course. The course starts July 12 and is free to club members and \$20 per person for non club members. For reservations and information call Richard Hoover at (281) 996-7716.

July 16

Spaceland Toastmasters meet: The Spaceland Toastmasters will meet at 7 a.m. July 16 at the House of Prayer Lutheran Church. For more information, call Jeannette Darcy at x45752.

Communicators meet: The Clear Lake Communicators will meet at 11:30 a.m. July 16 at the Lockheed

Martin, 555 Forge River Road. For more information, contact Richard Lehman at (281) 538-1854.

Spaceteam Toastmasters meet: The Spaceteam Toastmasters will meet at 11:30 a.m. July 16 at United Space Alliance, 600 Gemini. For details, call Pat Blackwell at (281) 282-4302, or Ben Black at 282-4166.

Astronomy seminar: The JSC Astronomy Seminar will meet at noon July 16 in Bldg. 31, Rm. 129. An open discussion meeting is planned. For more information, contact Al Jackson at x35037.

Radio club meets: The JSC Amateur Radio Club will meet at 7 p.m. July 16 at Piccadilly Cafeteria, 2465 Bay Area Blvd. For more information call Larry Dietrich at x39198.

Scuba club meets: The Lunarfinns will meet at 7:30 p.m. July 16 at the Redfish Restaurant under the Kemah/Seabrook bridge, Seabrook side. For more information call Fred Toole at x33201.

July 17

Directors meet: The Space Family Education board of directors will meet at 11:30 a.m. July 17 in Bldg. 45, Rm. 712D. For more information on this open meeting call Gretchen Thomas at x37664.

July 18

Simulation department reunion: The simulations department is hosting a reunion for people who were in the department from 1964 to 1984, at 4:30 p.m. July 18 at the Gilruth Center ballroom. Cost is \$2 per person. Reservations must be made by July 11 by calling Georgia Yawn x34563 or Johnny Reid x30102.

NASA Briefs

NASA selects Mars meteorite researchers

NASA has selected 16 proposals to study samples of the Martian meteorite as part of a coordinated program with the National Science Foundation that grew from the announcement last August that a JSC-led research team had found evidence of ancient Martian life in a sample of the meteorite. The NASA grants were awarded under the Ancient Martian Meteorite Research program, a coordinated research program to investigate this and related meteorites in greater depth. The awards total about \$1 million for the first year and about \$500,000 the second year.

NASA, NASDA set rainfall satellite date

NASA and the National Space Development Agency of Japan have set 2:40 p.m. CST Oct. 31 as the official launch date for the Tropical Rainfall Measuring Mission. The first Earth science satellite dedicated to studying the properties of tropical and subtropical rainfall, the satellite will carry microwave and visible/infrared sensors, and the first spaceborne rain radar.

Exploration pioneer Rahe dies in storm

Dr. Jurgen H. Rahe, 57, science program director for exploration of the solar system at NASA Headquarters, died tragically June 18 in the Washington, D.C. area. Rahe was killed during a storm when a large tree fell on his car as he was driving near his home in Potomac, Md. He had a distinguished career in the field of astronomy and space exploration. He was responsible for overall general management, budget, and strategic planning for NASA's Solar System Exploration programs, including the Galileo mission to Jupiter and upcoming missions to Mars, including the July 4, 1997, landing of Mars Pathfinder.

Scientists control robot remotely

From laboratories and a science center in North America, a group of NASA and Carnegie Mellon University scientists are controlling a robotic rover this summer as it explores a desert in South America to learn more about driving automated vehicles on Mars and the Moon. During the "Nomad" field experiment from June 15 to July 31, scientists from NASA's Ames Research Center and Carnegie Mellon's Robotics Institute, Pittsburgh, Pa., are conducting an unprecedented 120-mile robotic trek in the Atacama Desert in northern Chile.

Einstein was right—black holes do spin

A NASA scientist has made the first-ever observation of spinning black holes—confirming Einstein's theory that they spin. The new observations from several orbiting spacecraft adds to the growing body of knowledge on how these mysterious objects are formed and behave.

Black holes—predicted by Einstein's General Theory of Relativity—are believed to result from the collapse of a star or a group of stars. A black hole is an extremely compact and massive object with such a powerful gravitational field that nothing—not even light—can escape.

In a paper published by The Astrophysical Journal, Letters, Dr.

Shuang Nan Zhang of the Universities Space Research Association at NASA's Marshall Space Flight Center and his research associates report that two of the black holes they have studied are rapidly spinning—rotating 100,000 times per second—while others are spinning very slowly or not at all.

By comparison, before this discovery, the Crab Pulsar was considered to be among the most rapidly spinning objects in the universe, rotating 33 times per second.

"Black holes have always been difficult objects to define. We can only characterize them with three properties—mass, charge and spin,"

Zhang said.

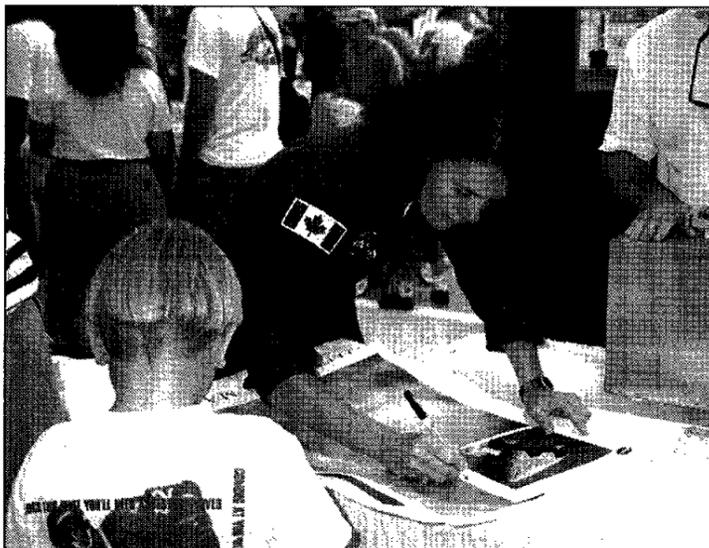
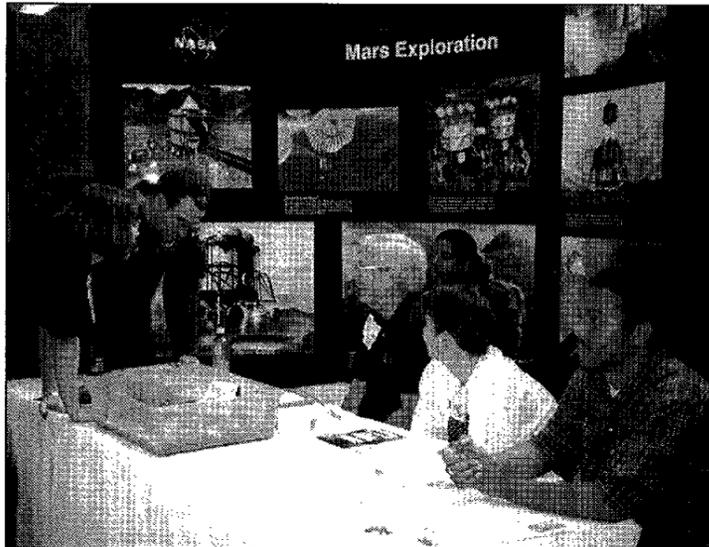
"In the past, we've only been able to measure a black hole's mass. But now that we've learned how to measure a second property — spin rate — one might say that we are two-thirds of the way to understanding black holes. This is a major leap in unraveling the black hole mystery," Zhang said.

"Determining the spin of black holes is of enormous importance, not only that the spin gives us an idea of how much angular momentum the black hole has 'swallowed' during its lifetime, but also we can examine whether the spin is related to the formation of powerful jets," said Dr. Mario Livio, senior scientific

staff member at the Space Telescope Science Institute. "The two rapidly spinning black holes also occasionally eject streams of high-speed material called relativistic jets from the black hole region—at roughly the same speed at which the hole is spinning," Zhang said.

Since a black hole emits no light, the best way to observe it and learn about its properties is to study its interaction with the environment around it.

"The Theory of Relativity explains that there should be a last stable orbit around the black hole," Zhang said. "Material inside this orbit cannot survive and is consumed by the black hole."



Photos by Ginger Gibson

MOODY OPENING—Visitors to Moody Garden's Discovery Pyramid Grand Opening on May 31 were treated to a variety of exhibits by JSC employees, illustrating the work done at the center. Visitors also had an opportunity to meet the latest class of Astronaut Candidates. 1) Astronaut Candidate Don Pettit signs autographs at the Mars exploration exhibit. Looking on from left to right are: Chris Jones, Everett Gibson, Michelle Wonk and Lindsay Edwards; 2) Canadian Astronaut Candidate Julie Payette signs autographs at the robotics technology exhibit; and 3) four members of the extravehicular activity project team provide a demonstration of the use of the extravehicular mobility unit space suit. Pictured from left to right are: Joey Marmolejo, Joe Settles, Keaton Chhipwadia and Jason Poffenberger.

First piece of U.S.-built station hardware flies to Cape

(Continued from Page 1)

Node 1 is now in Kennedy's Space Station Processing Facility, a new facility completed in 1994 and designed specifically for preparing space station elements for launch.

"The arrival of our first launch element—the Node—here at KSC has been a long time in coming and clearly is a major milestone for the program as we transition from the development phase into the operational phase," Brinkley said. "Seeing hardware here at the Cape brings a new dimension to the program. It

took tremendous effort by a lot of people, particularly the last six months, to be able to meet this milestone on time."

Assembly Flight 2A Launch Package Manager Bill Bastedo commended the work of the assembly and checkout teams.

"In the six months it was executed, they installed over 50,000 mechanical items," Bastedo said. "About 216 lines were installed into the different systems to carry fluids and gasses; over six miles of wire was used to put this together. It was

performed by a team of about 200 people that were very dedicated."

The node will be joined by two pressurized mating adapters, the first arriving at Kennedy in July from the McDonnell Douglas manufacturing facility in Huntington Beach, Calif. Prior to launch, the two conical mating adapters will be attached to either end of the node at Kennedy. In orbit, the two adapters will serve as the connecting point for the U.S. and Russian station segments and as a docking location for the shuttle.

"The Kennedy team at the Space

Station Processing Facility has been preparing for several years for this occasion," said Glenn Snyder, Kennedy payload manager for STS-88. "We are looking forward to getting started with the processing of the first element as well as the others that will follow."

Work on Node 1 at Kennedy will include the completion of assembly and checkout tasks; acceptance testing of the node and mating adapters; communications testing with Mission Control; leak testing; and toxicology testing.

STS-94 mirrors future International Space Station work

(Continued from Page 1)

and Payload Specialists Roger Crouch and Greg Linteris will spend more than two weeks in orbit aboard *Columbia* as they continue NASA's efforts to understand the subtle and complex phenomena associated with the influence of gravity in many aspects of daily life. They will conduct a variety of experiments to examine how various materials and liquids change and behave in the weightless environment of space.

The countdown for launch began on time at 2 p.m. CDT Saturday, June 28. The same day, the crew flew from Ellington Field to the Shuttle Landing Facility at KSC.

Columbia was targeted for launch from Launch Complex 39-A at 12:50 p.m. CDT. With an on-time launch on July 1 and a nominal 16-

day mission, *Columbia* should land at KSC on July 17 about 5:26 a.m. CDT.

STS-94 will continue the tests begun during STS-83 of hardware, facilities and procedures that will be used on the International Space Station. MSL-1 will again serve as a test-bed for new ways to conduct experiments in space — helping to validate and improve that process.

STS-94 also mirrors the future work aboard the station with international cooperation of the flight. The MSL-1 mission brings together academic, industrial and governmental partners from around the world. Scientists from four space agencies developed 33 investigations, and representatives of the European Space Agency, the German Space Agency and the National Space Development

Agency of Japan will participate.

While the STS-94 crew is busy in Earth orbit, processing on the other space shuttles continues.

Discovery, scheduled to conduct STS-85, is scheduled to roll from the Orbiter Processing Facility to the Vehicle Assembly Bldg. on July 7. After the orbiter is attached to the external tank, the entire launch stack will be moved out to Launch Pad 39A. The current target launch date for STS-85 is Aug. 7. However shuttle managers are considering trying to advance the launch date by a couple of days to avoid range conflicts.

STS-85 will involve deployment and retrieval of the CRISTA-SPAS payload using the shuttle's mechanical arm. The Manipulator Flight Demonstration, an attached payload, will demonstrate the oper-

ational capability of the Japanese Experiment Module remote Manipulator System's Small Fine Arm. *Discovery's* cargo bay will also contain the Technology Applications and Science payload, seven separate experiments mounted on a crossbay Hitchhiker structure.

Atlantis is being readied for the seventh docking mission to the Mir space station. STS-86, targeted for launch around Sept. 18, is the next planned exchange of U.S. astronauts. Mike Foale, who has been aboard Mir since mid-May will come home aboard *Atlantis*. If things go as planned, he will be replaced by astronaut Wendy Lawrence, who will live and work aboard the orbiting Russian facility until *Endeavour* docks with the station in January 1998.



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